REMARKS

Claim Rejections

Claims 7-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by Kojima et al. (U.S. 5,620,384).

It is noted that the reference to Kojima et al. was initially cited by the Examiner in the outstanding Final Office Action. Thus, this Amendment represents Applicant's initial opportunity to respond to the rejections based upon this reference.

Drawings

It is noted that the Examiner has accepted the proposed drawing submitted on June 21, 2005.

Claim Amendments

By this Amendment, Applicant has amended claims 7 and 11 of this application. It is believed that the amended claims specifically set forth each element of Applicant's invention in full compliance with 35 U.S.C. § 112, and define subject matter that is patentably distinguishable over the cited prior art.

As previously noted, one of the major objectives of the present invention is found in the Summary of the Invention, page 4, lines 27-32, which reads:

> in such a manner that, while said chain guide of the front derailleur is operating in the highest speed mode, said linkage rod is at a position substantially parallel to said seat tube, so that a restoring force provided by said return spring is equal to an active component force for actually shifting said chain, that is, the restoring force can be utilized fully for down-shifting.

Meaning that the present invention is focused only on the down-shifting operation that is shifting the chain from the highest level (the largest sprocket of the front derailleur) to the medium level.

In Column 1 Lines 34 of the cited reference to Kojima et al., the object of Kojima et al. is to teach a:

> means to convert an operating force of a control cable efficiently into torque for swinging a pivotal link....

As known, when the chain is located at the highest level (the largest sprocket of the front derailleur), the return spring (52) (see Figures 6 and 7) is fully coiled, so the spring (52) reserves the maximum returning force. Utilizing the maximum returning force efficiently to pull down the chain from the highest level (the largest sprocket of the front derailleur) to the medium level is the major inventive step of the present invention.

As shown in Figures 8 to 11, the chain guide (3) of the linkage mechanism is operating in highest speed mode -- the chain is engaged in the largest sprocket, and the linkage rod (4) is at a position parallel to the seat tube (A1) (this is the major feature of the structure of the present invention). Therefore, the imaginary vertical line V is located at an end of pivoting rang that the restoring force (FsH) of the return spring (52) is equal to the active component force (FcH) for actually shifting the chain (C), that is, the restoring force is utilized fully for down-shifting. When the chain guide pivots from the highest speed position through an angle ϕ_1 to the intermediate position, as shown in Fig. 9, the chain guide (3) receives a restoring force (FsM) from the return spring wherein only the active component force (FcM) thereby is actually utilized for down-shifting. When the chain guide pivots from the intermediate speed position through an angle $(\phi_2-\phi_1)$ to an low position, as shown in Fig. 10, the chain guide (3) receives a restoring force (FsL) from the return spring wherein only the active component force FcL thereby is actually utilized for down-shifting. Further, in Fig. 11, because the return spring undergoes a varying elastic deformation with the pivotal movement of the chain guide, the restoring force (FsM) in the intermediate position becomes greater than the restoring force (FsL) in the low speed position, and the restoring force (FsH) in the high position becomes greater than the restoring force (FsM) in the intermediate position. It becomes clear from Fig. 11 that FcH=FsH, FcM=FsM*cos ϕ_1, and FcL=FsL*cos ϕ_2.

Moreover, the moving track (T1) of the chain guide (3) according to the present invention is an upward continuous arc. Comparing the moving track (T2) of the prior art, as seen in Fig. 12, the track (T1) enables the chain guide (3) to be more adjacent to the larger sprocket of the chain-wheel B1. Besides, the return spring with less strength is used in the present invention since the restoring force is utilized fully for down-shifting in high speed mode comparing to the prior art so that less force will be needed for up-shifting. Consequently, the up-shifting efficiency is improved.

As illustrated in FIG. 13 of the present invention, it is well known in the prior art to make L1 = 39mm, L2 = 53mm (which is the same as the U.S. pat. Nos. 5,496,222 and 5,620,384), and B = 21mm, thus ϕ_2 is about equal to 41.81˙, that is

53 - 39 = 14

21 * sin ϕ_2 = 14

ϕ_2 = sin⁻¹(14/21)

If the length of B is 16mm, then ϕ_2 is about equal to 61.05˙. If the length of B is 14mm, then ϕ_2 is about equal to 90˙. Therefore, in actual practice, the length B shall be larger than L2-L1. In fact, the length of B is different in different manufacturers according to different specification.

The cited reference to Kojima et al. '384 teaches how to convert the operational force of a control cable efficiently into torque to shift the chain from the low speed sprocket (smaller sprocket) to the high speed sprocket (largest sprocket). The technology taught by Kojima et al. '384 is for up-shifting. Up-shifting uses the force of the user rather than a spring. Therefore Kojima et al. '384 teaches how to convert the user's force to the torque efficiently. IN the present invention the down-shifting is achieved by the return spring. Therefore, in the present invention, teaches how to utilize the return spring to retain the maximum restoring force.

In respect of force variation, the down-shifting of the present invention also differs from up-shifting of Kojima et al. '384. In Figures 9 and 10 of Kojima et al. '384, the force varies from angle A to angle B, which cross over the vertical line H. However, in the present invention, see Figures 8, 9, 10 and 11, the force applied to down-shifting varies in angle ϕ_1, and does not cross over vertical line V. The return

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spring will retain the maximum restoring force when the force reaches the vertical line V.

Kojima et al. '384 do not teach when the chain guide is in the highest speed mode, the linkage rod is located at a position substantially parallel with the seat tube and the restoring force of the return spring is equal to an active component force required for shifting the chain and the restoring force is utilized for down- shifting.

It is axiomatic in U.S. patent law that, in order for a reference to anticipate a claimed structure, it must clearly disclose each and every feature of the claimed structure. Applicant submits that it is abundantly clear, as discussed above, that Kojima et al. '384 do not disclose each and every feature of Applicant's amended claims and, therefore, could not possibly anticipate these claims under 35 U.S.C. § 102. Absent a specific showing of these features, Kojima et al. '384 cannot be said to anticipate any of Applicant's amended claims under 35 U.S.C. § 102.

It is further submitted that Kojima et al. '384 do not disclose, or suggest any modification of the specifically disclosed structures that would lead one having ordinary skill in the art to arrive at Applicant's claimed structure. Thus, it is not believed that Kojima et al. '384 render obvious any of Applicant's amended claims under 35 U.S.C. § 103.

Summary

In view of the foregoing, Applicant submits that this application is now in condition for allowance and such action is respectfully requested.

Should the Examiner not be of the opinion that this case is in condition for allowance, it is requested that this amendment be entered for the purposes of appeal, since it represents Applicant's initial opportunity to respond to the rejections based upon Kojima et al. '384.

Should any points remain in issue, which the Examiner feels could best be resolved by either a personal or a telephone interview, it is urged that Applicant's local attorney be contacted at the exchange listed below.

Respectfully submitted,

Date: <u>February 8, 2006</u>   By: _____

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